Comparison of key skills specifications 2000/2002 with 2004 standardsX015461July 2004Issue 1

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Mark Scheme (Results)

November 2011

Applications of Mathematics (GCSE)

Unit 1: 5AM1F\_01

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**NOTES ON MARKING PRINCIPLES**

**1** All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.

**2** Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.

**3** All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate’s response is not worthy of credit according to the mark scheme.

**4** Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.

**5** Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

**6** Mark schemes will indicate within the table where, and which strands of QWC, are being assessed. The strands are as follows:

i) *ensure that text is legible and that spelling, punctuation and grammar are accurate so that meaning is clear*

Comprehension and meaning is clear by using correct notation and labeling conventions.

ii*) select* *and use a form and style of writing appropriate to purpose and to complex subject matter*

Reasoning, explanation or argument is correct and appropriately structured to convey mathematical reasoning.

iii) *organise information clearly and coherently, using specialist vocabulary when appropriate*.

The mathematical methods and processes used are coherently and clearly organised and the appropriate mathematical vocabulary used.

**7** **With working**

If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.

If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.

If it is clear from the working that the “correct” answer has been obtained from incorrect working, award 0 marks. Send the response to review, and discuss each of these situations with your Team Leader.

If there is no answer on the answer line then check the working for an obvious answer.

Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks. Discuss each of these situations with your Team Leader.

If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

**8** **Follow through marks**

Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, but if ambiguous do not award.

Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

**9** **Ignoring subsequent work**

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: e.g. incorrect canceling of a fraction that would otherwise be correct

It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect e.g. algebra.

Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

**10** **Probability**

Probability answers must be given a fractions, percentages or decimals. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).

Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.

If a probability answer is given on the answer line using both incorrect and correct notation, award the marks.

If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

**11** **Linear equations**

Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded.

**12 Parts of questions**

Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

**13 Range of answers**

Unless otherwise stated, when an answer is given as a range (e.g 3.5 – 4.2) then this is inclusive of the end points (e.g 3.5, 4.2) and includes all numbers within the range (e.g 4, 4.1)

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| **Guidance on the use of codes within this mark scheme** |
| M1 – method mark  A1 – accuracy mark  B1 – Working mark  C1 – communication mark  QWC – quality of written communication  oe – or equivalent  cao – correct answer only  ft – follow through  sc – special case  dep – dependent (on a previous mark or conclusion)  indep – independent  isw – ignore subsequent working |

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| **5AM1F\_01** | | | | | |
| **Question** | | **Working** | **Answer** | **Mark** | **Notes** |
| 1 | (a) |  | 8900 | 1 | B1 for 8900 (accept in words) |
|  | (b) |  | 29 000 | 1 | B1 for 29000 (accept in words) |
| 2 | (a) |  | −10 | 1 | B1cao |
|  | (b) |  | 24° indicated | 1 | B1 for 24° marked (±1°) (accept any clear indication) |
|  | (c) |  | 75 km/h indicated | 1 | B1 for 75 km/h marked (±2.5 km/h) (accept any clear indication) |
| 3 |  | 7.35 – 4.5  2.85 × 1000 | 2850 | 3 | M1 for 7.35 – 4.5 or 2.85 seen or digits 285  M1 for “2.85” × 1000  A1 ft  OR  M1 for 4.5 × 1000 or 7.35 × 1000 or 4500 or 7350  M1 for “7350” − “4500”  A1 ft |
| 4 | (a) |  | 5 | 1 | B1cao |
|  | (b) |  | Thursday | 1 | B1 for Thursday (accept incorrect spelling) |
|  | (c) |  | 52 | 2 | M1 for attempt to add frequencies  (condone 1 incorrect) A1 ft |
|  | (d) | 5+7+11+13+16 | increases | 1 | B1 for description of change, eg the absences increase, goes up (accept change of 11) |

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| **5AM1F\_01** | | | | | |
| **Question** | | **Working** | **Answer** | **Mark** | **Notes** |
| 5 |  | 200 − 50 150 ÷ 12 | 12.50 | 4 | M1 for 200 – 50 or 150 seen M1 for “200 − 50” ÷ 12 A1 for 12.5(0)  B1 for correct money notation |
| 6 | (a) |  | 1, 0, 1 | 2 | B2 for all 3 correct answers (B1 for 1 or 2 correct answers) |
|  | (b)(i) |  | correct symbol ticked | 2 | B1 for tick under second symbol |
|  | (ii) |  | 3 |  | B1 for 3  (SC B1 for (ii) if the first or third symbol is ticked in (i) and order 1 given in (ii)) |
| 7 | (a) |  | correct arrangement shown | 2 | B2 twelve stones shown in a rectangle (ok if pond in the middle) or a rectangle with correctly labelled sides  (B1 for rectangle drawn or 12 stones used) |
|  | (b)(i) |  | 10 | 3 | B1cao |
|  | (ii) |  | 14m² |  | B1 for 14 B1 for m² |
| \*8 |  |  | diagram or chart | 4 | B1 for suitable labels or key to differentiate women and men B1 for Protein, Fat, Fibre and Salt clearly labelled B1 for accurately representing the data – bars of correct height  C1 (dep on B2) for fully correct diagram or chart |

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| **5AM1F\_01** | | | | | |
| **Question** | | **Working** | **Answer** | **Mark** | **Notes** |
| \*9 |  | 4.9 + 5.5 + 9.2 + 66.5 + 21.7 4.8 + 5.2 + 8.8 + 67.7 + 22.1  − 0.1 + − 0.3 + − 0.4 + 1.2 + 0.4 | 2006 | 3 | M1 for 4.9 + 5.5 + 9.2 + 66.5 + 21.7 or 4.8 + 5.2 + 8.8 + 67.7 + 22.1 A1 for 107.8 and 108.6 C1 (dep on M1) for correct conclusion that more passengers used the airports in 2006 and a clear comparison of the figures to reach the conclusion.  OR  M1 for attempt to find the differences each year and total  A1 for 0.8 or − 0.8  C1 (dep on M1) for correct conclusion that more passengers used the airports in 2006 and a clear comparison of the figures to reach the conclusion. |
| 10 | (a) |  | 433 | 1 | B1 cao |
|  | (b) |  | Tours | 1 | B1 cao |
|  | (c) | 294 + 312 | 606 | 2 | M1 for 294+312 or one of 294 and 312 seen in the addition of only two distances A1 cao |

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| **5AM1F\_01** | | | | | |
| **Question** | | **Working** | **Answer** | **Mark** | **Notes** |
| 11 | (a) |  | 8.45pm | 2 | M1 for attempt to subtract 15 or 30 minutes from 9 30 or 9 15 seen or 9 00 seen  A1 for 8 45 (pm) |
|  | (b) | 2 × £3.30 + £2.50 £20 − £9.10 | 10.90 | 3 | M1 for 2 × 3.30 + 2.50 M1 (dep) for 20 − “9.10” A1 cao  OR  M1 for 20 – 3.30 or 20 – 2.50  M1 for 20 – 3.30 – 3.30 – 2.50 oe  A1 cao |
|  | (c) | 9 30 to 6 00 = 3.5 hours  3.5 × 5 = 17.5 hours per week  17.5 × 6.8 = £119  8 30 to 12 30 = 4 hours  1 30 to 5 30 = 4 hours  8 × 2 = 16 hours per weekend  16 × 7.50 = £120 | Patrick | 5 | M1 3.5 or 8 or 4  M1 3.5 × 5 or 17.5 or 16 or 8 × 2  M1 “17.5 × 6.8 or “16” × 7.5 or 119 or 120  A1 119 and 120  C1 (dep on M1) correct based on their answers |

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| **5AM1F\_01** | | | | | |
| **Question** | | **Working** | **Answer** | **Mark** | **Notes** |
| 12 | (a ) |  | April | 1 | B1 cao |
|  | (b) |  | 5 | 1 | B1 cao |
|  | (c)(i) |  | 4.50  3.49  5.95  19.42 | 6 | B1 cao for each of the first three entries.  B1 ft for total |
|  | (ii) | 28 × 65 | Cheaper to buy |  | M1 for 28 × 65  A1 ft for £18.20 and correct conclusion  Or  M1 “19.42”÷28 or digits 69 seen  A1 ft £0.69 and correct conclusion |
| 13 | (a) | 30 × 4 + 160 | 280 | 2 | M1 for 30 × 4 or 120 seen  A1 cao |
|  | (b) | 356 – 20  336 ÷ 8 | 42 | 3 | M1 for subtraction of 20  M1(dep) for divide by 8  A1 cao  OR  M1 for 8 × “*n*” + 20 = 356  M1 for attempt to subtract 20 from each side or divide each side by 8  A1 cao |
|  | (c) | 4*n +* 160 *=* 8*n +* 20  8*n –* 4*n =* 160 – 20  4*n =* 140  *n =* 140 ÷ 4 | 35 | 4 | M1 for 4*n* + 160 or 8*n* + 20 seen  M1 for 4*n* + 160 = 8*n* + 20  M1 for clear correct method to isolate terms in *n* isolate number terms on opposite sides of a four term equation eg. 8*n* – 4*n* = 160 – 20  A1 cao |

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| **5AM1F\_01** | | | | | |
| **Question** | | **Working** | **Answer** | **Mark** | **Notes** |
| 14 |  | 360 ÷ 40 = 9 25 × 9 = 225 11 × 9 = 99 4 × 9 = 36 | angles of 255°, 99°, 36° | 4 | M1 for 360 ÷ 40 A2 for all 3 sectors correct (A1 for 1 sector or value correct) B1 for correct labelling |
| 15 | (i) |  | 187.50 | 2 | B1 for W = 187.5(0) |
|  | (ii) |  | 37.50 |  | B1 for S = 37.5(0) |
| 16 | (a) | 11 + 11 + 13 + 5 +14 + 8 = 62  100 − “62” | 38 | 2 | M1 for adding the percentages or 62 seen A1 cao |
|  | (b) | Or | Katie spends more | 3 | M1 for  A1 for 11.4 C1 (dep on M1) for conclusion ft from comparison of two percentages  OR  M1 for  or for 10% = 42.5(0), 1% = 4.25,  42.5(0) + 4.25  A1 for 46.75 C1 (dep on M1) for correct ft from comparison of “46.75” and 48.45 |

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| **5AM1F\_01** | | | | | |
| **Question** | | **Working** | **Answer** | **Mark** | **Notes** |
| 17 | (a) |  | |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | under 18 years | 18 – 64 years | 65 years and over | Total | | Male | 2 | 7 | 3 | 12 | | Female | 1 | 6 | 1 | 8 | | Total | 3 | 13 | 4 | 20 | | 3 | B3 cao  (B2 for 6 - 11 correct entries in figures or tallies)  B1 for2 - 5 correct entries in figures or tallies) (If B0 scored, allow SC B1 for correct totals for their table) |
|  | (b) |  | 15% | 2 | M1 for “3” from table A1 for 15% or  or ft from table (accept ratio) 0.15 |

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| **5AM1F\_01** | | | | | |
| **Question** | | **Working** | **Answer** | **Mark** | **Notes** |
| 18 | (a) | 2*x* + 3*x* + 3*x* = 360 8*x* = 360 | 45 | 2 | M1 for 2*x* + 3*x* + 3*x* = 360 or 360 ÷ 8 ie complete method A1 cao |
|  | (b)(i) | 3*y* + 20 + 2*y* + *y* + 10 | 6*y* + 30 | 4 | M1 for 3*y* + 20 + 2*y* + *y* + 10  A1 for 6*y* + 30 (=180) |
|  | (ii) | 6*y* + 30 = 180  *y* = (180 – 30) ÷ 6 | 25 |  | M1 for “6*y* + 30” = 180 or correct sequence of operations using “6*y* + 30” and 180 A1 ft on an equation of the form *ay + b* = 180  T&I B2 for 25, B0 otherwise |
| 19 |  | 208 + 10.40   1.05 × 208 | 218.40 | 3 | M1 for 0.05 × 280 or 10.4(0) M1(dep) for 208 + “10.40”  A1 for 218.40  OR  M2 for 1.05 × 208 oe  A1 for 218.40 |
| 20 | (a) |  | 28g butter 14g flour 142m*l* milk 84g cheese | 2 | M1 for use of 1 ounce = 28g or 1 pint= 568m*l* (may be implied by at least 2 correct quantities)  A1 cao |
|  | (b) | 12 × 142 | 1.704 | 2 | M1 for 12 × “142” or sight of figures 1704 A1 ft (accept 1.7, 1.70) |

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| **5AM1F\_01** | | | | | |
| **Question** | | **Working** | **Answer** | **Mark** | **Notes** |
| 21 | (a) |  | Point plotted | 1 | B1 for plotting (10, 19) tol ±1 sq |
|  | (b) |  | Line of best fit | 1 | B1 for a straight line passing between (1, 4) and (1, 8) and between (17, 24) and (17, 28) |
|  | (c) |  | Relationship described | 1 | B1 for ‘as the number of years they have done their job increases, so does their (hourly) pay’ oe  Or  B1 ‘positive correlation’ oe |
| 22 |  | 6 × 4.5 27 ÷ 1.44 19 × £12.87 | £244.53 | 4 | M1 for 6 × 4.5 M1 for “6 × 4.5” ÷ 1.44  M1 for “19” × £12.87 A1 cao |

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